CLAIMS

What is claimed is:

1. A method of forming an optical communication path, comprising:
   a) creating a channel within a planar layer; and
   b) forming at least a portion of an optical path within the channel.

2. The method of claim 1 wherein step a) further comprises creating the channel using a selected one of a chemical, mechanical, and a thermal process to remove planar layer material.

3. The method of claim 1 wherein step a) comprises molding the planar layer with the channel.

4. The method of claim 1 wherein step a) further comprises:
   i) lithographically defining a location of the optical path on a face of the planar layer; and
   ii) etching the planar layer along the defined location of the optical path to create the channel.

5. The method of claim 1 wherein step b) further comprises filling the channel with an optical core medium.

6. The method of claim 1 wherein step b) further comprises:
   i. depositing a first cladding portion within the channel; and
   ii. depositing an optical core medium within the channel; and
   iii. depositing a second cladding portion over the optical core medium.

7. The method of claim 6 wherein one of the first and second cladding portions has an index of refraction less than an optical core medium index of refraction.

8. The method of claim 6 wherein at least one of the first and second cladding portions is optically reflective along a side adjacent the optical core medium.

9. The method of claim 1 further comprising:

i. depositing a cladding portion within the channel; and

ii. depositing an optical core medium within the channel.

10. The method of claim 9 wherein the cladding portion has an index of refraction less than an optical core medium index of refraction.

11. The method of claim 9 wherein the cladding portion is optically reflective along a side adjacent the optical core medium.

12. The method of claim 1 wherein the planar layer is a selected one of a conductor, nonconductor, and semiconductor layer.

13. The method of claim 1 wherein walls of the channel have a lower index of refraction than that of the optical core medium.

14. The method of claim 1 wherein the optical path is substantially non-cylindrical.

15. The method of claim 1, further comprising:

c) forming an electrical trace supported by the planar layer.

16. A method of forming an optical communication path, comprising:

a) providing a first planar layer having a channeled face defining a first channel;

b) providing a second planar layer having a complementary channeled face defining a second channel; and

c) placing the first and second planar layers such that the first and complementary second channels oppose each other to form a composite channel defining the optical path.

17. The method of claim 16 further comprising applying a reflective coating to the first and second planar layers.

18. The method of claim 16 further comprising depositing an optical core medium within the first and second channels.

19. The method of claim 16 further comprising filling the composite channel with an optical core medium.

20. The method of claim 16 further comprising applying a reflecting coating over the first and second channels.

21. The method of claim 16 wherein the first and second channels have a semi-circular cross-section.

22. The method of claim 16 wherein one of the first and second channels is created through a selected one of a chemical, mechanical, or thermal process applied to a planar layer.

23. The method of claim 16 wherein one of the first and second planar layers is molded with its respective channel.

24. A method of forming an optical path, comprising:

a) providing a sheet photosensitive to an optical source of a pre-determined wavelength; and

b) exposing the sheet to an optical path mask in the presence of the optical source to define an optical path lying within the plane of the sheet.

25. The method of claim 24 further comprising:

c) adhering the exposed optical sheet to a first planar layer.

26. The method of claim 24 wherein a cross-sectional width of the optical path is substantially greater than a cross-sectional height of the optical path.

27. The method of claim 24 further comprising:

c) applying a reflective coating to at least one face of the sheet in an area sufficient to cover one side of the optical path.

28. An optical communication apparatus comprising:

a planar layer; and

an optical path at least a portion of which is formed within the planar layer.

29. The apparatus of claim 28 wherein the planar layer further comprises a channel, wherein the optical path is disposed within the channel.

30. The apparatus of claim 29 further comprising a first reflective cladding portion deposited within the channel.

31. The apparatus of claim 29 further comprising an optical core medium disposed within the channel.

32. The apparatus of claim 31 further comprising a reflective cladding portion disposed over the optical core medium.

33. The apparatus of claim 30 further comprising a second reflective cladding portion disposed over the channel.

34. The apparatus of claim 29 wherein a cross-section of the optical path is substantially non-circular.

35. An optical communication apparatus comprising:
a plurality of planar layers stacked to form a board; and
a plurality of optical paths wherein each optical path is formed substantially within a distinct layer of the plurality of layers.

36. The apparatus of claim 35 further comprising:
a via coupling optical paths lying in distinct planes.

37. The apparatus of claim 36 further comprising:
a reflective via insert, wherein at least a portion of the reflective via insert is disposed within each of the optical paths coupled by the via.

38. An optical communication apparatus, comprising:
a first planar layer having a channel;
a first reflective layer deposited within the channel; and
a second reflective layer deposited over the channel, wherein the first and second reflective layers co-operate to form an optical path.

39. The apparatus of claim 38 further comprising:
an optical core medium disposed within the channel.

40. The apparatus of claim 38 wherein the optical path is substantially non-cylindrical.

41. An optical communication apparatus, comprising:
a first planar layer having a channeled face defining a first channel; and
a second planar layer having a complementary channeled face defining a second channel, wherein the first and second planar layers are relatively disposed such that the first and second channels oppose each other to form a composite channel for carrying optical signals.

42. The apparatus of claim 41 further comprising:
a first mirrored layer deposited along walls of the first channel; and
a second mirrored layer deposited along walls of the second channel.

43. The apparatus of claim 41 further comprising:
an optical core medium disposed within the composite channel.

44. The apparatus of claim 41 wherein at least one of the planar layers is substantially formed from at least one of a conductive layer, a non-conductive layer, and a semiconductor layer.

45. The apparatus of claim 41 wherein a cross-section of the composite optical path is substantially non-circular.

46. The apparatus of claim 41 wherein a cross-section of the composite optical path is substantially rectangular.

47. An optical communication apparatus, comprising:
a sheet having a defined optical path lying within a plane of the sheet, wherein the optical path is defined by regions of opaqueness within the sheet.

48. The method of claim 47 further comprising a first planar layer adhered to the sheet.

49. The method of claim 47 wherein a cross-sectional width of the optical path is substantially greater than a cross-sectional height of the optical path.